ABSTRACT OF THE DISCLOSURE

A method of forming an antenna beam with a phased array antenna having an array of antenna elements includes selecting angular directions at which nulls are to be located in an antenna radiation pattern of the phased array antenna, computing a radiation shaping transformation as a function of the selected angular directions, and determining from the radiation shaping transformation an amplitude and phase distribution over the array of antenna elements that forms the antenna beam with nulls of the antenna radiation pattern at the selected angular directions. Computing of the radiation shaping transformation involves constructing a set of vectors corresponding to the selected antenna radiation pattern nulls, and computing a matrix whose product with each of the vectors is zero. The amplitude and phase distribution is determined from the matrix.